

A1 a conductor electrically connecting said gas concentration sensor and said microcomputer for transmission of the signal from said gas concentration sensor to said microcomputer;

wherein the microcomputer is configured to process the signal outputted from said gas concentration sensor to produce a voltage signal indicative of the concentration of said at least one of NO<sub>x</sub>, HC, and CO.

Sub B1  
A2 3. (Amended) A gas concentration measuring apparatus as set forth in claim 1, wherein said microcomputer includes an impedance measuring circuit measuring an impedance of the sensor element of said gas concentration sensor and said microcomputer controls a power supply to a heater which heats the sensor element, said microcomputer controlling said power supply as a function of the measured impedance.

Sub B2 5. (Amended) A gas concentration measuring apparatus as set forth in claim 1, wherein the gas concentration measuring apparatus is mounted in a vehicle, and wherein said microcomputer outputs said signal to a vehicular engine electronic control unit by serial communication.

A3 6. (Amended) A gas concentration measuring apparatus as set forth in claim 1, wherein said sensor element includes a first cell responsive to application of a voltage to discharge oxygen contained in the gasses outside said gas concentration sensor, producing a first electric current as a function of concentration of the discharged oxygen and a second cell responsive to application of a voltage to produce a second electric current as a function of

concentration of a specified gas component contained in the gasses from which the oxygen is discharged by the first cell.

7. (Amended) A gas concentration measuring apparatus as set forth in claim 1, wherein said microcomputer compensates for unit-to-unit variation in the characteristics of said gas concentration sensor.

A3 8. (Amended) A gas concentration measuring apparatus as set forth in claim 7, wherein said microcomputer corrects an output characteristic of said gas concentration sensor so as to agree with a desired one.

9. (Amended) A gas concentration measuring apparatus as set forth in claim 3, wherein said impedance measuring circuit compensates for unit-to-unit variation in the characteristics of said gas concentration sensor.

A4 11. (Amended) A gas concentration measuring apparatus as set forth in claim 4, wherein said heater control circuit is connected to said heater through a power supply conductor for supplying the power to said heater, said heater control circuit minimizing an error component caused by a resistance value of the power supply conductor.

Sub B3 12. (Amended) A gas concentration measuring apparatus as set forth in claim 1, further comprising  
an impedance measuring circuit measuring an impedance of a sensor element of said gas concentration sensor,

a heater which heats a sensor element of said gas concentration sensor, and a heater control circuit which controls a power supply to said heater,

and wherein said microcomputer, said impedance measuring circuit, and said heater control circuit are formed on a bare chip mounted on a ceramic substrate.

13. (Amended) A gas concentration measuring apparatus comprising:

A 4 a gas concentration sensor outputting a signal as a function of concentration of at least one of NO<sub>x</sub>, HC, and CO;

a microcomputer disposed within a connector configured to connect said microcomputer to an external device, said connector having one end connected to said gas concentration sensor and another end connected to the external device;

wherein said microcomputer processes the signal outputted from said gas concentration sensor to produce a voltage signal indicative of the concentration of said at least one of NO<sub>x</sub>, HC, and CO.

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Please enter the following new claim:

A 5 14. (Newly added) A gas concentration measuring apparatus as set forth in claim 6, wherein said gas concentration sensor controls the first and second cells using a map.